Oaklins

Home run: Al takes HVAC to a new level

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"Artificial intelligence (AI) and the Internet of Things (IoT) have promising applications in HVAC, allowing for enhanced energy efficiency and improved indoor environmental quality. Using IoT to link HVAC systems helps economize costs and monitor performance to detect issues before they become major outages.

In this newsletter we explore the growing trend towards smarter and more efficient HVAC systems, and their benefits for manufacturers, contractors and end users."

> PHILIP BARKER HVAC SPECIALIST, OAKLINS

MARKET OBSERVATIONS

Moving forward

Various factors, including climate change, tech advances and COVID-19, are driving key changes across the HVAC industry.

M&A ACTIVITY

Smart moves

We provide an overview of recent transactions completed in HVAC, highlighting the sector's buoyancy and potential for future growth.



CASE STUDY

Challenge accepted

With the support of Oaklins, SIT S.p.A. has successfully closed its cross-border acquisition of Janz-Contagem e Gestão de Fluídos S.A. 09

Market observations

Heating, ventilation and air-conditioning (HVAC) businesses are undergoing unprecedented change, with advances in technology and automation, the growing influence of the Internet of Things (IoT), climate change concerns and COVID-19 all playing a part.

Despite a global slowdown in travel due to COVID-19, the amount of CO₂ in the earth's atmosphere hit an all-time high in May 2020¹. Residential and commercial properties are significant contributors to greenhouse gas (GHG) emissions, accounting for over one-third of both energy use and energy-related GHG emissions globally.² After the onset of the COVID-19 pandemic in early 2020 and the staging of COP26 in November 2021, 'smart homes' and home automation are gaining increasing traction, a shift accelerated by recent advances in Artificial Intelligence (AI) and predictive analytics.

A smart home is one in which homeowners can control appliances, thermostats, lights and other devices remotely, using a smartphone or tablet and an internet connection. Appliances and devices connect to each other via Wi-Fi and are accessible through one central point — e.g. an app, a mobile device or a cloud-based device such as Amazon Alexa, Google Home or the Apple HomeKit.

Google acquired smart home startup Nest for US\$3.2 billion in 2014, signaling the market's growing interest in smart homes, with Amazon and Apple quickly joining the smart home industry. Amazon went on a run of smart home-related acquisitions, purchasing smart camera maker Blink in December 2017 for US\$90 million, closely followed by Ring, a security and home-automation vendor, for nearly US\$1 billion in February 2018.



Global share held by buildings and construction in terms of energy use and GHG emissions, 2018

¹ https://research.noaa.gov/article/ArtMID/587/ArticleID/2636/Rise-of-carbon-dioxide-unabated#:[~]:text=Atmospheric%20carbon%20dioxide%20measured%20 at,California%20San%20Diego%20announced%20today.

² Zhong, X., Hu, M., Deetman, S., Steubing, B., Lin, H.X., Hernandez, G.A., Harpprecht, C., Zhang, C., Tukker, A. and Behrens, P., 2021. Global greenhouse gas emissions from residential and commercial building materials and mitigation strategies to 2060. Nature Communications, 12(1).

A record number of acquisitions (286) in the smart buildings space in 2021 represented a 31% increase on the deals completed in 2020, and a 10% increase on the previous record of 259 transactions in 2019.³

Retailers are also stepping up their home automation efforts, with many large retailers introducing dedicated smart home sections.

The global smart home market was valued at US\$86.5 billion in 2020 and is expected to grow to US\$381 billion in 2028, at a CAGR of 21% between 2021 and 2028.⁴

Within the wider sector, the growing demand for smart HVAC can be seen in the upward trajectory of the smart thermostat market. The global smart thermostat market is estimated to have reached US\$965 million in 2021 and is forecast to grow to US\$2.6 billion by 2026, at a CAGR of 21.7%.⁵

Propelling these trends are continuing advances in AI and IoT that have promising applications in HVAC, namely for improving energy efficiency and indoor air quality (IAQ) by optimizing airflow, temperature and humidity. As HVAC systems contribute to almost 50% of the total energy usage in buildings,⁶ improvements in energy efficiency can help achieve major savings.

'SMART' HVAC SYSTEMS

Internal conditions within buildings change constantly, making efficient control of HVAC systems a challenge. Fluctuating outdoor temperatures, varying occupancy levels inside buildings and indoor activity all impact the interior conditions of a building. Manually controlled and preprogrammed HVAC systems cannot adjust to these changing conditions efficiently. Smart control systems provide the solution by processing real-time data and adjusting the HVAC systems to operate at peak optimal performance based on variable building conditions.

A traditional HVAC system is programmed to turn on or off at set times or when the temperature in a specific part of the building (generally where the thermostat is located) reaches a certain temperature. Smart HVAC systems remove the need to manually program cycles as the controller, or thermostat, automatically adjusts the temperature of each part of the building using quick and precise adaptive algorithms to reduce energy consumption while providing optimal comfort. These algorithms receive data inputs from a variety of sources:

- Infrared motion detectors
- Humidity measurers
- Noise sensors/detectors
- Thermometers (internal and external)
- GPS and geofencing (where an app or software uses GPS, RFID, Wi-Fi or cellular data to trigger a predefined action when a smart device or RFID tag goes in or out of a virtual boundary)

Global smart thermostat market



Source: ResearchAndMarkets.com







⁴ Smart Home Market Size, Share & COVID-19 Impact Analysis, By Product (Home Monitoring/Security, Smart Lighting, Entertainment, Smart Appliances and Others) and Regional Forecast, 2021-2018. Available at: https://www.fortunebusinessinsights.com/industry-reports/smart-home-market-101900.

⁵ Global Smart Thermostat Market (2021-2026) by Connectivity, Specification, Product, Installation, Component, Vertical, Geography, Competitive Analysis and the Impact of Covid-19 with Ansoff Analysis by ResearchAndMarkets.com.

⁶ https://www.sciencedirect.com/science/article/abs/pii/S0378778807001016



Source: https://euristiq.com/smart-hvac-systems

By further implementing IoT capabilities into HVAC systems, there is potential for even more significant energy savings. Connecting systems to the internet can enable the live streaming of local weather forecasts, which, together with sensors and GPS, can further improve predictability and help adjust system calibrations to maximize efficiency and minimize waste.

SMART CONTROLS FOR VENTILATION SYSTEMS

Over-ventilation represents a waste of energy, while under-ventilation is detrimental to IAQ. Air quality management represents a key concern for indoor environments, especially now that COVID-19 has highlighted how microbial aerosols pose a threat to human health, and so require proper monitoring.⁷

Smart ventilation systems can determine the optimal airflow based on a range of variables including the number of occupants in the building, outdoor thermal and air quality conditions, and the concentration of key air pollutants like volatile organic compounds and particulate matter.

HVAC SYSTEMS

Heating and cooling controls must optimize for energy consumption and human comfort. Recent reports have demonstrated human productivity is extremely sensitive to changes in temperature, with a study by Lawrence Berkeley National Laboratory finding that human productivity reaches its peak at 21–22°C and decreases when temperatures are above 23–24°C.

A smart system, rather than relying on a circuit board in the thermostat, uses algorithms and sensors to gather performance data to automatically regulate the amount of energy used to heat or cool a building. It moves the required technology from the thermostat or control system to the HVAC equipment.

⁷ Zanni, S., Motta, G., Mura, M., Longo, M. and Caiulo, D., 2021. The Challenge of Indoor Air Quality Management: A Case Study in the Hospitality Industry at the Time of the Pandemic. Atmosphere, 12(7), p.880.

BENEFITS OF AI IN HVAC SOLUTIONS

- Cost savings: By adjusting the temperature and ventilation systems according to real-time occupancy, weather conditions and levels of CO₂, the system consumes only enough resources as is needed, thereby reducing energy waste and utility bills. A study from 2019 proves that a smart HVAC control performs 57% better than a manual control strategy.⁸
- Minimizing energy wastage: Energy consumption fluctuates throughout the day and throughout the seasons. During working hours, commercial buildings use more electricity than residential properties and energy usage on heating is lower in summer months than winter months. Smart controllers automatically adjust settings to optimize temperatures to avoid wasted heating or cooling periods. Introducing IoT capabilities to HVAC systems makes it possible to link to local weather data to automatically adjust settings to regulate indoor conditions.

- Better comfort for the user:

Smart HVAC systems are highly customizable and allow users to have complete control over the system. The combination of smart HVAC with machine learning helps the system to learn and adapt to user preferences. In a 2020 study, an Al-enabled smart HVAC system increased customer comfort from 75% to 95% while reducing daily energy usage by 20% during peak summer heat.⁹

Real-time monitoring of system performance: Smart sensors constantly monitor the integrity of the HVAC infrastructure and send alerts when maintenance is required. Some applications go further and book repair services automatically, sending an 'error report' out with the booking. Smart systems also use predictive analytics to identify the likelihood of when certain heating and cooling components will malfunction. They monitor the HVAC system round the clock to track performance, and can warn of equipment failure before it happens.

Although IoT is a relatively new technology, it has already transformed the HVAC industry. It is becoming the standard in 2022 to install smart HVAC systems into new buildings. By optimizing energy consumption, smart HVAC makes facilities more sustainable with benefits offered to all stakeholders, including landowners, building managers, employees, occupants and the local community, by reducing energy consumption and waste.



Smart home technology poised for blockbuster growth

* Compound annual growth rate, i.e. the average annual growth rate for each category between 2018 and 2022

Sources: IDC, Statistica

⁸ https://euristiq.com/smart-hvac-systems/

⁹ https://www.achrnews.com/articles/143912-internet-of-things-improves-hvac-efficiency-and-effectiveness

Selected public company valuations

Manufacturers	Head office location	Enterprise value	Enterprise value			
		(US\$m)	LTM sales	NTM sales	LTM EBITDA	NTM EBITDA
A. O. Smith Corporation		10,000	2.8x	2.4x	13.8x	11.8x
AAON, Inc.		1,883	5.3x	4.0x	28.4x	18.3x
Daikin Industries, Ltd.	۲	45,820	2.0x	1.9x	13.4x	12.6x
De'Longhi S.p.A.		3,755	1.1x	1.1x	7.2x	8.0x
Gree Electric Appliances, Inc. of Zhuhai		12,993	0.5x	0.4x	3.2x	2.9x
Johnson Controls International plc		55,144	2.3x	2.1x	10.9x	13.2x
Modine Manufacturing Company		829	0.4x	0.4x	5.0x	4.9x
NIBE Industrier AB (publ)		22,806	7.0x	6.1x	37.8x	33.1x
Sinko Industries Ltd.	۲	218	0.7x	N/A	4.0x	N/A
SPX Corporation		2,016	1.7x	1.5x	14.6x	9.9x
Systemair AB (publ)		1,653	1.7x	1.6x	14.7x	12.3x
Zehnder Group AG		844	1.1x	1.0x	8.4x	8.0x

Source: Capital IQ

Selected public company valuation trends

EMEA HISTORICAL MULTIPLES



Source: Capital IQ



AMERICAS HISTORICAL MULTIPLES

Source: Capital IQ

ASIA-PACIFIC HISTORICAL MULTIPLES



Source: Capital IQ



GLOBAL HISTORICAL MULTIPLES

Source: Capital IQ

Recent M&A activity

Oaklins has identified several transactions in the global HVAC sector that completed between Q1 2021 andw Q4 2021.

A record number of acquisitions in the smart buildings space in 2021 represented a 31% increase on the deals completed in 2020. This trend is set to continue for the next few years as companies look to add IoT capabilities to their offerings to remain competitive and keep abreast of the growing concerns regarding increasing energy consumption worldwide.

The strong activity in this sector, particularly in cross-border M&A, demonstrates how larger players are increasingly focused on broadening their global footprint by gaining access to new technologies and markets through acquisitions.

Date	Target	Bidder	Country	Target description	Valuation		
					EV (US\$m)	EV/ Rev	EV/ EBITDA
Nov-21	Building Engines	🌘 JLL		A provider of property management technologies	300	N/A	N/A
Nov-21	() brivo	CROWN		A smart building company providing cloud-based access control and video surveillance products	808	7.3x	N/A
Oct-21	STERIL AIRE	MADISON [®] INDUSTRIES		Manufacturer of ultraviolet C (UV-C) emitters for HVACR systems	N/A	N/A	N/A
Oct-21	NORTEK CONTROL	Nice	<u>چ</u>	Developer of technology for security, home automation, control, power, AV and entertainment, access control, health and AI systems for residential and commercial markets	285	N/A	N/A
Jun-21		MADISON [®] INDUSTRIES		Provider of critical air management, thermal, HVAC and indoor air quality solutions	3,630	2.2x	12.5x
Mar-21	Energy Soving Innovative Controls Limited	ADDTECH		Manufacturer of heating control and smart home products	N/A	N/A	N/A
Mar-21	EKGARD	NCT		Manufacturer of environmental control units, refrigeration and heat transfer equipment	N/A	N/A	N/A
Mar-21		TINICUM		Manufacturer of industrial heaters, temperature sensors, controllers, and supporting software and assemblies	N/A	N/A	N/A
Feb-21	R klimat®	<pre>@volution</pre>		Manufactures and sells indoor climate products, such as ventilation, heating and energy-saving equipment	4.8	3.3x	N/A
Jan-21	WOLSELEY W	CLAYTON DUBILIER & RICE	*	Distributer of plumbing, heating and building products	418.6	0.2x	N/A

Median	359.3	2.8 x	12.5x
Average	907.7	3.3x	12.5x



SIT S.P.A. HAS ACQUIRED JANZ CGF S.A.

The rise of an international leader in the gas and water smart meters sector.

SIT S.p.A. has completed its acquisition of Janz - Contagem e Gestão de Fluídos S.A. (Janz), a consolidated Portuguese player specialized in manufacturing residential water meters. The price, excluding cash and debt, amounts to US\$34.3 million. An earnout of up to US\$1 million was also stipulated on the basis of achieving certain targets in 2021. SIT is a multinational listed on the Italian Stock Exchange that, through its heating and smart gas metering divisions, creates intelligent solutions for the control of environmental conditions and consumption measurement.

Janz is a consolidated European manufacturer and distributor of residential volumetric water meters. It develops a wide range of mechanical meters and particularly excels in volumetric metrological technology, used not only in its own meters but also in those supplied to the leading operators in the sector.

Oaklins' teams in Italy and Portugal advised the buyer throughout the acquisition process.



has acquired



M&A BUY-SIDE Energy/Industrial Machinery & Components/ Other Industries

"Oaklins' commitment and international reach have been crucial for identifying the right target for us and throughout the acquisition process. The team's professionalism and dedication helped us to smoothly negotiate the path of this complex cross-border acquisition, carried out almost entirely remotely to cope with the COVID-19 situation."

> FEDERICO DE STEFANI CEO AND CHAIRMAN, SIT S.P.A.

Deep local roots, global commitment

Oaklins brings you opportunities from across the world and we meet you with our expertise wherever you are

OAKLINS OFFERS A COMPREHENSIVE RANGE OF SERVICES

- M&A advisory (buy- and sell-side)
- Growth equity and equity capital markets advisory
- Debt advisory
- Corporate finance services

HVAC is one of our focus areas. Combining comprehensive sector knowledge with global execution has led Oaklins to become one of the most experienced M&A advisors in the HVAC sector, with a large network of relevant market players worldwide. This results in the best possible merger, acquisition and divestment opportunities for HVAC companies.

If mergers, acquisitions, or divestitures of businesses or business units are part of your strategy, we would welcome the opportunity to exchange ideas with you.

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Philip leads Oaklins' HVAC team and is a director of mergers & acquisitions and head of industrials at Oaklins Smith & Williamson, one of Oaklins' member firms in the UK. Previously, he spent 20 years as head of industrials at Oaklins Cavendish. Philip has completed over 15 sales in the HVAC sector, including assisting Oaklins Sweden on the sale of VoltAir Systems, air handling units for heat recovery in buildings, to Volution; the sale of Energy Technique, fan coils and commercial heating products, to Volution; the sale of Greenwood Air Management, ventilation and extractor fans, to Zehnder; the sale of Levolux, solar shading screens, to Alumasc; working with Oaklins Denmark to sell York Novenco, HVAC+R systems for marine and offshore, to Dania Capital; and the sale of Nuaire, fans and ventilation systems, to ECI Private Equity.



United by a strong belief that we can achieve the extraordinary. Oaklins is a global team of 850+ financial advisory professionals in 45 countries providing M&A, growth equity, ECM, debt advisory and corporate finance services to support entrepreneurs, corporates and investors in reaching their goals.

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